

-----Original Message-----

From: Doug Kirk [mailto:DKirk@ftek.com]  
Sent: Saturday, January 17, 2009 12:13 PM  
To: Weyman Lee  
Subject: Russell City Energy Project

Mr. Lee:

Please accept this comment on the Amended PSD permit.

The use of ammonia in either 19% or 29% solution, will indeed add an unnecessary risk element to this project, both in storage and in the frequent transport of the required reagent through the community. Fuel Tech has a cost effective and commercially established technology that converts urea solutions to ammonia reagents for use with SCRs.

Also your analysis of the EMx, SCONox technology omits two very relevant and important facts: one, the technology may not use ammonia, but the technology makes ammonia, and two, the technology is net GHG emitter, for every pound of NOx reduced it generates 8 pounds of CO2 via the regeneration process. The regeneration process, which makes H2 and CO2 necessary for the conversion of the potassium to the carbonate state, is the source of both the ammonia and CO2.

The technology provider only indicates the process does not use ammonia, but fails to note that the process releases ammonia. The amount of ammonia released is a variable of the amount of nitrogen in the natural gas, and amount air leaks, which have been pervasive in existing operations. Moreover none of the existing operators test for ammonia or has ammonia been part any start up testing protocol that I am aware of. As result each system runs with an unknown, unmeasured and uncontrolled amount of ammonia slip.

This is a blaring omission from yours and other BACT analysis conducted on this technology.

I have attached a product bulletin on the urea to ammonia process.

Good luck with your hearing next week, and thank you for allowing me to comment, and I welcome the opportunity to respond to any question or the need for additional information.

Doug

01-17-09-Doug Kirk\_RCEC Comments.txt  
&#9474; 310.405.1061 &#9474; dkirk@ftek.com &#9474;

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## TECHNICAL BENEFITS

- Simplified process, highly efficient urea conversion
- Non-hazardous materials throughout
- Low pressure operation
- Process controls designed to follow load and provide easy shutdown
- Liquid reagent system easily modified for dry urea feedstock
- Backed by Fuel Tech's proven start-up, optimization, and service experience

## Smart, safe, and simple... NOxOUT<sup>®</sup> ULTRA<sup>™</sup> provides SCR ammonia supply without the headaches of hazardous chemical handling.

Selective catalytic reduction (SCR) has become a standard for meeting the most stringent NO<sub>x</sub> reduction requirements from power generation systems. Requiring ammonia (NH<sub>3</sub>) as the reducing agent, operators of these systems have had little choice but to accept the handling issues, potential liability, and associated costs in using a hazardous chemical supply.

Fuel Tech's NOxOUT<sup>®</sup> ULTRA<sup>™</sup> system is a new alternative that offers an ammonia feed from a safe urea supply. Available for new SCR systems and as a retrofit to existing applications, NOxOUT<sup>®</sup> ULTRA<sup>™</sup> is a cost-effective solution that simplifies SCR operation.

### Urea vs. NH<sub>3</sub>

The advantages of a urea-based system over traditional anhydrous ammonia or aqueous supplies are clear. Anhydrous ammonia is classified as a hazardous chemical per CAA Section 112(r). As such, ammonia requires safety procedures to protect personnel, neighboring communities, and the environment from unforeseen chemical release. Reporting, record keeping, permitting, and emergency preparedness planning are generally

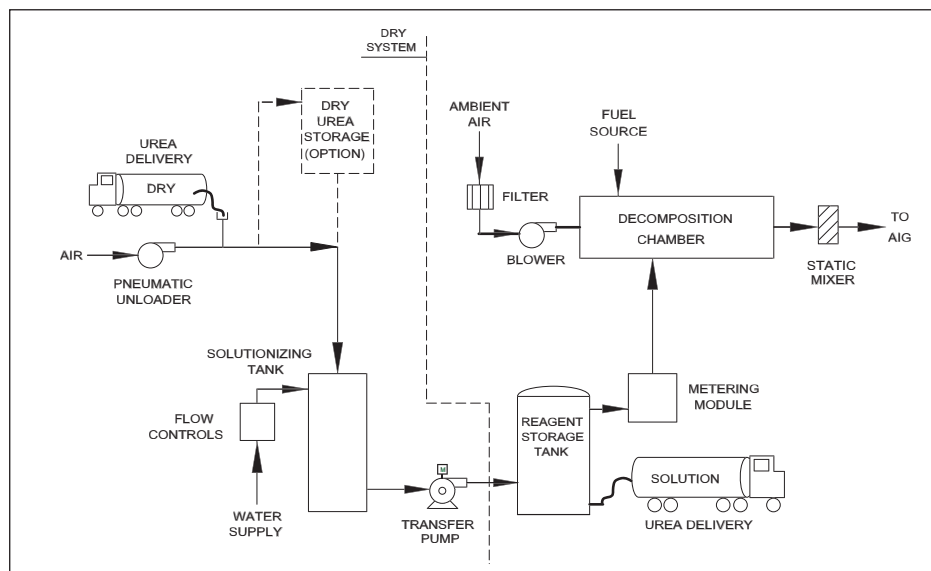
all needed with on-site ammonia storage. Aqueous ammonia-based systems also require specialized equipment, including pressure vessels, a heated vaporizer, and other features, and have significantly higher operating costs than urea-based systems.

In contrast, urea products are non-hazardous sources of ammonia, so their transport, storage, and use are greatly simplified. Fuel Tech has extensive, proven experience with urea-based systems, and the NOxOUT<sup>®</sup> ULTRA<sup>™</sup> system is built on that solid foundation.

Other urea-to-ammonia conversion systems on the market work by hydrolyzing urea on-site. These processes are complex, expensive, and include a high pressure vessel containing ammonia. NOxOUT<sup>®</sup> ULTRA<sup>™</sup> is a more economical and easier way to generate ammonia.

### Design Simplicity

The NOxOUT<sup>®</sup> ULTRA<sup>™</sup> process provides ammonia for SCR systems by decomposing urea to feed the traditional ammonia injection grid (AIG). The process relies on post-combustion reactions in a chamber designed to



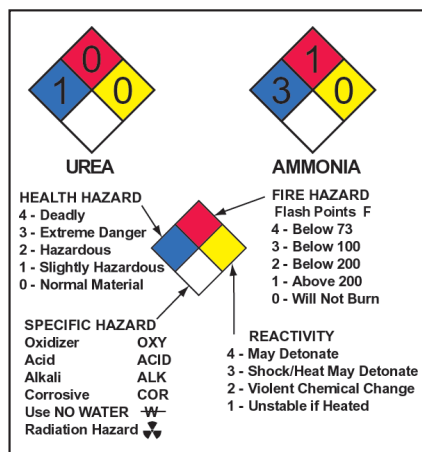
control urea decomposition in a specified temperature window (600-1000 °F). The NOxOUT® ULTRA™ system is simple, consisting of a blower, decomposition chamber, chemical pumping system, urea storage, and process controls.

Filtered ambient air is fed into the chamber through the use of a blower with automatic dampers to control discharge flow and pressure. A burner is fired downstream of the dampers, and an aqueous urea solution supplied by the storage and pumping system is sprayed into the post-combustion gases through the injectors. The urea is efficiently converted to ammonia in the decomposition chamber, and that ammonia feeds the AIG for a traditional SCR system.



### System Options

The NOxOUT® ULTRA™ system can be customized for each application.



For larger systems, an in-duct gas-to-gas heat exchanger can be supplied to preheat the process air and minimize operating costs.

The liquid portion of the system can be supplied with dilution water capability to accommodate delivery of concentrated reagent solutions.

The dry urea system components can be supplied to provide flexibility for reagent selection.

### New Process, Proven Technologies

The NOxOUT® ULTRA™ process incorporates commercially proven features of Fuel Tech's other NOx reduction products. Urea storage, pumping, metering, and injection are all standard to the NOxOUT® product

line, first introduced in 1990. The NOxOUT CASCADE® process relies on careful duct and gas flow dynamics design. The NOxOUT SCR® system relies on the conversion of urea to ammonia for SCR reactions. So while NOxOUT® ULTRA™ is a new product to our mix of process solutions, the established technologies and know-how of Fuel Tech make it a uniquely reliable urea conversion system.



The NOxOUT® ULTRA™ system has all the benefits of direct ammonia supply for SCR without the cost, safety and environmental concerns associated with ammonia handling. More cost-effective than urea-hydrolyzing processes, NOxOUT® ULTRA™ from Fuel Tech is a smart choice for simplifying SCR operation with a urea-to-ammonia conversion process.

For more information on NOxOUT ULTRA™ programs available from Fuel Tech, call, fax, or write Fuel Tech at:

Fuel Tech, Inc. • 512 Kingsland Drive • Batavia, IL 60510  
 Phone 800.666.9688 • 630.845.4500 • Fax 630.845.4501  
[www.fueltechnv.com](http://www.fueltechnv.com) • [webmaster@fueltechnv.com](mailto:webmaster@fueltechnv.com)

